

IMMUNOLOGY WITH LABORATORY TECHNOLOGIES	
GENERAL INFORMATIONS	
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Study Programme	Undergraduate university study of Medical laboratory diagnostics
Status of the course	mandatory
Year of study, semester	2.year, 4.semestar
ECTS	4
Workload (hours)	Lectures: 30 ; Seminars: 5; Laboratory exercises:15
Expected number of students	30-35
COURSE DESCRIPTION	
Course objectives	
The aim of this course is to acquire basic knowledge about the structure and function of the immune system and the course of the immune response in order to better understand the laboratory diagnostic methods used in the diagnosis of disorders of the immune system and infectious diseases.	
Enrolment requirements and entry competencies	
Acquired conditions for enrollment in the second year of studies.	
Learning outcomes at the Programme level	
1.1, 1.2, 2.1, 2.2, 2.3, 2.6, 3.1	
Learning outcomes (5-10)	
After completing lectures, seminars and exercises, independent study and passing the exam, students will be able to:	
<ol style="list-style-type: none"> 1. Present the molecular, cellular and tissue structure of the immune system, 2. To link biological characteristics and normal development of innate and acquired immunity with the outcomes of impaired development and/or deficiency of immune components. 3. compare antigen recognition mechanisms, specific and non-specific immune reaction mechanisms and immunoregulatory mechanisms of stimulating and suppressing the immune reaction 4. Classify and compare humoral and cellular executive mechanisms of the immune reaction 5. Compare the consequences of an excessive or insufficient immune reaction and diseases that arise as a result of the immunopathophysiological process (autoimmune diseases, hypersensitivity reactions, immune deficiencies) and conclude on the principles for therapeutic modulation of the immune system. 6. To connect the mechanisms of basic immunity with the principles of transplantation immunology 7. Assess the possibilities of influencing the immune reaction (vaccination, immunostimulation and immunosuppression) 8. Integrate information about the mechanisms by which the immune system participates in the prevention/occurrence of neoplasms and critically evaluate and select approaches to the treatment of malignant diseases based on the modulation of the immune system. 9. Describe and compare the mechanisms by which innate and acquired immunity suppress bacterial, fungal and viral infections, as well as the consequences of ineffectiveness of individual actions. 	
Course content	

Lectures: Introduction to the immune system. Innate immunity. Antigen collection and presentation antigens to lymphocytes. Recognition of antigens in the acquired immune system. Cell-mediated immunity. Executive mechanisms of Tcell-mediated immunity. Immunological tolerance and autoimmunity. Immune responses to tumors. Humoral immune responses. Executive mechanisms of humoral immunity.

Exercises: Research methods in immunology (Flow cytometry, CD antigens). Methods of proof humoral immunity I (Radioimmunoassay, RIST, RAST, In vitro hypersensitivity tests, electrophoresis and immunoelectrophoresis). Methods for proving humoral immunity II (Complement binding reaction, Agglutination tests). Methods for demonstrating humoral immunity III (Immunofluorescence). Determination of tissue kinship.

Seminars: Hypersensitivity. Congenital and acquired immunodeficiencies

Mode of teaching

Lectures, Problem solving seminars, Laboratory exercises

Student obligations

The student is obliged to regularly attend and actively participate in all forms of classes. The successful performance of seminars and exercises requires prior preparation of the student. To work in the laboratory, the student must have prescribed work clothes (white corner) and literature. Attending all forms of classes is mandatory, and the student must pass all knowledge tests. A student can excuse himself from 30% of each form of teaching. Uncompleted exercises and seminars must be passed.

Monitoring student work (Connectivity of learning outcomes, teaching methods and grading)

Teaching activity	ECTS	Learning outcome	Student activity	Assessment methods	Grade points	
					Min.	Max.
Attending classes	0,5	1-9	Class attendance	Attendance record	2	4
Seminars	0,5	1-9	Preparation of seminar	Seminar presentation	3	6
					5	10
Exercises	0,5	1-9	entrance exams, performing exercises, keeping work diary	work diary, entrance exam	40	80
Final exam	2,5	1-9	Studying for the final exam	Written exam	50	100
Total	4					

Evaluation of the final written exam:

Percentage of correct answers (%)	Ocjenski bodovi
95-100	80
90-94,99	75
85-89,99	70

80-84,99	65
75-79,99	60
70-74,99	55

Calculation of final grade:

Grade points earned in the final exam are added to the grade points earned during the course. Grading in the ECTS system is done by absolute distribution, i.e. based on total achievement and is compared to the numerical system in the following manner: A - excellent (5): 90-100 grade points; B - very good (4): 80-89.99 grade points; C - good (3): 65-79.99 grade points; D - sufficient (2): 50-64.99 grade points.

Required reading (available in the library and through other media)

Title	Number of copies in the library	Availability through other media
Abbas A i sur. Osnove imunologije. Funkcije i poremećaji imunološkog sustava. 5. izd. -Split : Medicinski fakultet, 2017. -	5	
Vježbe iz imunologije, nastavni materijali, Medicinski fakultet u Osijeku, 2008 i M. Taradi (ur): Priručnik za vježbe iz fiziologije, Medicinska naklada, Zagreb, 2003.	2	

Additional reading

1. Lectures synopsis

Course evaluation procedures

Anonymous, quantitative, standardised student survey on the course and the teacher's work implemented by the Quality improvement office of the Faculty of Medicine Osijek.